

07-LA-1 PM 7.71/9.23,
07-LA 103 PM 1.03/2.61,
07- LA-107 PM 2.26/3.22, 3.78/3.93,
07-LA-110 6.52/8.57,
07-LA 213 PM 7.76/9.10,
07-LA-405 PM 8.19/14.40, 14.94/15.31
Implementation of the Dominguez Channel Estuary
Bathymetry and Sediment Transport Study
Caltrans Agreement No. 07-5154
E-FIS: 0015000014, EA: 07-910217

MEMORANDUM OF AGREEMENT
BETWEEN

THE CITY OF CARSON, THE CITY OF LONG BEACH, THE CITY OF LOS ANGELES,
THE CITY OF TORRANCE, CALIFORNIA DEPARTMENT OF TRANSPORTATION,
THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, AND THE COUNTY OF
LOS ANGELES

REGARDING THE ADMINISTRATION AND COST SHARING FOR
IMPLEMENTATION OF THE DOMINGUEZ CHANNEL ESTUARY
BATHYMETRY AND SEDIMENT TRANSPORT STUDY

This Memorandum of Agreement (MOA), is made and entered into between THE CITY OF CARSON, a municipal corporation, THE CITY OF LONG BEACH, a municipal corporation, THE CITY OF LOS ANGELES, a body corporate and politic, and THE CITY OF TORRANCE, a municipal corporation, CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS), LOS ANGELES COUNTY FLOOD CONTROL DISTRICT (LACFCD), a body corporate and politic, and THE COUNTY OF LOS ANGELES (COUNTY), a political subdivision of the State of California. Collectively, these entities shall be known herein as "PARTIES" or individually as "PARTY."

WITNESSETH

WHEREAS, the Regional Water Quality Control Board, Los Angeles Region (Regional Board) adopted the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Order No. R4-2012-0175 (MS4 Permit); and

WHEREAS, the MS4 Permit became effective on December 28, 2012 and requires that the LACFCD, COUNTY, and 84 of the 88 cities (excluding Avalon, Lancaster, Long Beach, and Palmdale) within the County of Los Angeles comply with the prescribed elements of the MS4 Permit; and

WHEREAS, the NPDES Statewide Storm Water Permit Waste Discharge Requirements (WDRS) for State of California Department of Transportation (Caltrans) became effective on September 19, 2012 and requires Caltrans to comply with the prescribed elements of the NPDES Permit for Caltrans; and

01007.0546/534384.1

WHEREAS, the United States Environmental Protection Agency (USEPA) established the Total Maximum Daily Loads for Toxic Pollutants on March 23, 2012, with the intent of protecting and improving water quality in the Dominguez Channel and the Greater Los Angeles and Long Beach Harbor Waters (Dominguez Channel Toxics TMDL); and

WHEREAS, the Dominguez Channel Toxics TMDL and its requirements have been incorporated into the MS4 Permit; and

WHEREAS, the PARTIES as listed in Exhibit B, have collaborated and completed development of a Contaminated Sediment Management Plan (CSMP) for the PARTIES to comply with certain elements of the MS4 Permit; and

WHEREAS, the Contaminated Sediment Management Plan (CSMP) identifies three special studies that would eventually guide the approach to the future sediment management actions, beginning with the Bathymetry and Sediment Transport Study (Special Study); and

WHEREAS, the PARTIES agree that each shall assume full and independent responsibility for ensuring its own compliance with the MS4 Permit despite the collaborative approach of the MOA; and

WHEREAS, the COUNTY on behalf of the PARTIES, prepared a final Scope of Work, attached hereto as Exhibit C and incorporated herein by reference, and Request for Proposal to obtain a consultant to execute the Special Study for the PARTIES to comply with certain elements of the MS4 Permit; and

WHEREAS, the PARTIES intend that the consultant retained pursuant to this MOA will execute the Special Study in compliance with certain elements of the MS4 Permit; and

WHEREAS, the PARTIES have determined that hiring a consultant to execute the Special Study will be beneficial to the PARTIES and they desire to participate and will provide funding in accordance with the cost allocation in Table 3 of Exhibit A; and

WHEREAS, the COUNTY, on behalf of the PARTIES, has retained a consultant, CDM Smith Inc.; and

WHEREAS, the COUNTY will act on behalf of the PARTIES in the administration of the consultant service agreement for the execution of the Special Study (Consultant Contract); and

WHEREAS, the PARTIES have agreed that the total cost for developing the Special Study shall not exceed four hundred twenty seven thousand, six hundred ninety two dollars (\$427,692) including contract administration cost and a 5% contingency; and

WHEREAS, other MS4 Permittees may wish to participate in the Special Study; and

WHEREAS, the PARTIES contemplate allowing other MS4 Permittees to participate in the Special Study and fund their pro-rata share in accordance with Table 2 of Exhibit A; and

WHEREAS, the PARTIES agree that other MS4 Permittees may join in this MOA by entering into an amendment to this MOA, to be executed by the COUNTY on behalf of the remaining PARTIES. When doing so, the COUNTY shall not bind the PARTIES to an obligation that is greater than what is stated in this original agreement. The net result of such amendment(s) will reduce the currently shown pro rata share of the PARTIES.

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the PARTIES, and of the promises contained in this MOA, the PARTIES agree as follows:

Section 1. Recitals: The recitals set forth above are fully incorporated as part of this MOA.

Section 2. Purpose: The purpose of this MOA is to execute the Special Study as specified in the CSMP.

Section 3. Cooperation: The PARTIES shall fully cooperate with one another to attain the purpose of this MOA.

Section 4. Voluntary: This MOA is voluntarily entered into for the purpose of executing the Special Study as specified in the CSMP.

Section 5. Term: This MOA shall become effective as to each PARTY on the date that PARTY signs this MOA, and shall remain in effect for five (5) years OR until (1) the Regional Board gives final approval to the last outstanding portion of the Special Study, (2) the COUNTY has provided written notice of completion of the Scope of Work attached hereto, and (3) the COUNTY has received payment by all PARTIES of their allocated pro-rata share hereunder, whichever comes later.

Section 6. Assessment for Proportional Cost for Special Study: The PARTIES agree to pay the COUNTY for execution of the Special Study in the amounts shown in Table 3 of Exhibit A, based on the cost allocation formula shown in Table 2 of Exhibit A, attached hereto and made part of this MOA by this reference. The COUNTY will invoice the PARTIES upon execution of this MOA as shown in Table 3 of Exhibit A, based on the allocated costs for execution of the Special Study.

Section 7. COUNTY Agrees:

- a. To utilize the funds deposited by the PARTIES only for the administration of the Consultant Contract, project management, and the preparation and completion of the Special Study.
- b. To contract with the consultant retained pursuant to this MOA and to be responsible for coordinating the activities of the consultant. The COUNTY will be compensated for the administration and management of the Consultant Contract at a percentage of five percent (5%) of each PARTY'S contract cost for execution of the Special Study as described in Table 3 of Exhibit A. The COUNTY will comply with all procurement requirements and laws applicable to said selection. The COUNTY shall ensure adherence to the Scope of Work attached as Exhibit C.
- c. To provide an accounting within ninety (90) days after the termination of the MOA or within ninety (90) days of cancellation thereof and return to each PARTY its proportional share of the unused portion of all funds deposited with the COUNTY, if any, in accordance with the cost allocation formula in Table 2 of Exhibit A, or reallocated for use in the next Special Study, if any, by means of an amendment to this MOA or as a provision in a new MOA.
- d. To notify the PARTIES in writing if the actual cost of the execution of the Special Study will exceed the cost shown in Exhibit A and obtain written approval of the increase from the PARTIES. Upon written approval of the increased costs by the PARTIES, the COUNTY will invoice the PARTIES per the cost allocation formula in Table 2 of Exhibit A for these additional expenditures at an amount not to exceed five percent (5%) of the original cost estimate as shown in Exhibit A. This five percent (5%) contingency will not be invoiced unless actual expenditures exceed the original cost. Expenditures that exceed the five percent (5%) contingency will require an amendment to this MOA.
- e. The PARTIES have sixty (60) days from receipt of the invoice to provide the payment to COUNTY.

Section 8. The PARTIES further agree:

- a. To make a full faith effort to cooperate with one another to achieve the purposes of this MOA by providing information about project opportunities,

reviewing deliverables in a timely manner, and informing their respective administration, agency heads, and/or governing body.

- b. To fund the cost of the execution of the Special Study and to pay the COUNTY for the execution of the Special Study based on the cost allocation shown in Table 3 of Exhibit A within sixty (60) days of receiving an invoice.
- c. To grant reasonable access rights and entry to the consultant, on an as-needed basis during the terms of this MOA, to any PARTY'S storm drains, channels, catch basins, and related properties (FACILITIES) to achieve the purposes of this MOA, provided, however that prior to entering any PARTY'S FACILITIES, the COUNTY or the consultant shall provide written notice to such PARTY at least seventy-two (72) hours in advance. For the purposes of this provision, written notice shall include notice delivered via e-mail that has been delivered to the applicable PARTY representative identified on Exhibit B.
- d. That other MS4 Permittees may join in this agreement by entering into an amendment to this MOA, provided that (1) all PARTIES to this MOA agree to allow the MS4 Permittee to participate in the Special Study and agree on the amount that MS4 Permittee will be required to contribute; and (2) the amendment will not increase the cost share of any existing PARTY to this MOA. Notwithstanding section 12(e) of this MOA, the PARTIES agree that an amendment to add such an MS4 Permittee as a contributing participant in the Special Study may be executed by the COUNTY on behalf of the remaining PARTIES, and that, upon execution of such an amendment by the COUNTY and the MS4 Permittee, that MS4 Permittee will become a PARTY to this MOA and shall be subject to all the rights, duties, and obligations set forth in this MOA. When doing so, the COUNTY shall not bind the PARTIES to an obligation that is greater than what is stated in this original agreement. The net result of such amendment(s) will reduce the currently shown pro rata share of the PARTIES accordingly.
- e. Grant of Access Rights Onto Caltrans Right of Way – Any party intending to enter onto a Caltrans right of way shall first make a written request to Caltrans, identifying the site location, extent of access by persons (and equipment, if any), dates and times of entry, as well as an explanation of the purpose of that entry. Caltrans shall thereafter determine, within ten (10) working days, if that entry will be allowed without a formal Encroachment Permit issued by the District Permit Engineer as an authorized presence of non-Caltrans parties not interfering with or threatening the safety of the traveling public or the integrity of the Caltrans infrastructure. In such case, Caltrans shall condition that right of entry on the accompaniment of a Caltrans representative who shall be empowered to restrict or limit the access of those

permittees, as deemed necessary, at the sole discretion of Caltrans. Where adverse impacts to traffic or the traveled way can be anticipated by Caltrans, Caltrans may require the requesting party to submit a formal Encroachment Permit application, to be filed and completed together with Traffic Control Plans when necessary (which must be prepared by or under the supervision of a traffic engineer licensed in the State of California) with the District Permit Engineer. An Encroachment Permit may require as many as six (6) weeks to be issued depending upon the extent of coordination and development of traffic controls required for that access. Caltrans will endeavor, in good faith, to satisfy all requests for access as promptly as possible.

- f. Caltrans Obligations - All obligations of Caltrans under the terms of this MOA are subject to the appropriation of the resources by the Legislature and the allocation of resources by the California Transportation Commission. This MOA has been written before ascertaining the availability of federal or state legislative appropriation of funds, for the mutual benefit of the Parties in order to avoid program and fiscal delays that would occur if the MOA was executed after that determination was made. This MOA is valid and enforceable as to Caltrans as if sufficient funds have been made available to Caltrans by the United States Government or California State Legislature for the purposes set forth in this MOA. If the United States Government or the California State Legislature does not appropriate sufficient funds for Caltrans to participate in this MOA, this MOA may be amended in writing by the Parties to reflect any agreed upon reduction in the percentage of funds contributed by Caltrans to continue its participation in this MOA. Caltrans, however, has the option to withdraw from this MOA in the event sufficient funds are not appropriated for Caltrans. Should Caltrans exercise its option to withdraw from this MOA, Caltrans shall remain responsible for its share of liability, if any, incurred while participating in this MOA.

Section 9. Invoice and Payment

- a. Payment: The PARTIES shall reimburse the COUNTY for their proportional share of costs for execution of the Special Study as shown in Table 3 of Exhibit A within sixty (60) days of receiving an invoice from the COUNTY.
- b. Invoice: The COUNTY will invoice PARTIES as shown in Table 3 of Exhibit A. Each PARTY will be invoiced upon its execution of this MOA.
- c. Caltrans agrees to pay the COUNTY not exceeding the amounts shown in Exhibit A and based on the cost allocation formula in Table B and the total estimated annual cost in Exhibit A attached hereto and made part of the MOA by this reference.

- d. Caltrans funding encumbered under this MOA is evidenced by the signature of its District Budget Manager certifying as to funds in the maximum sum of thirteen thousand, two hundred twenty nine dollars (\$13,229) as indicated in Exhibit A having been allocated and represents Caltrans' share of the work costs including contract administration fee and a 5% contingency as specified in Section 7(d) of this MOA. Any cost to be invoiced above this sum will require an amendment to this MOA.

Section 10: Indemnification

- a. To the extent permitted by law, each PARTY shall indemnify, defend, and hold harmless each other PARTY, including its special districts, elected and appointed officers, employees, agents, attorneys, and designated volunteers from and against any and all liability, including, but not limited to demands, claims, actions, fees, costs, and expenses (including reasonable attorney's and expert witness fees), arising from or connected with the respective negligent, unlawful, or wrongful acts of each PARTY arising from or related to this MOA; provided, however, that no PARTY shall indemnify another PARTY for that PARTY's own negligence or willful misconduct.
- b. It is understood and agreed that indemnifying Parties and/or their agents, to the extent permitted by law, shall fully defend, indemnify and save harmless other MOA Parties and all its officers and employees from all claims, suits or actions of every name, kind and description brought forth under, including, but not limited to, tortious, contractual, inverse condemnation or other theories or assertions of liability occurring by reason of anything done or omitted to be done by the indemnifying Party and/or its agents under this MOA; provided, however, that neither the MOA Party nor any officer or employee thereof is responsible for any injury, damage or liability occurring by reason of anything done or omitted to be done by the other MOA Party(s) and/or its agents under or in connection with any work, authority or jurisdiction conferred upon the other MOA Party(s) under this MOA.

Section 11. Termination or Forfeiture

- a. This MOA may be terminated upon the express written agreement of all PARTIES. If this MOA is terminated, the PARTIES agree that remaining funds deposited, if there are any after payment of invoices due at the time of termination, will be distributed based upon the same percentage as such funds were contributed. Completed work shall be owned by all PARTIES. Rights to uncompleted work by the Consultant still under contract will be held by the PARTY or PARTIES who fund the completion of such work.

- b. If a PARTY fails to substantially comply with any of the terms or conditions of this MOA, that PARTY shall forfeit its rights to work completed through this MOA, but no such forfeiture shall occur unless and until the defaulting PARTY has first been given reasonable notice of its default and, a reasonable opportunity to cure the alleged default.
- c. Caltrans maximum liability for costs shall be limited to the amount reflected in Exhibit A, and incurred by the COUNTY up to the date of the termination, unless an additional five percent (5%) increase with written approval is incurred due to contingency as specified in Section 7(d) of this MOA.
- d. Withdrawal by any PARTY from the terms of the Agreement. Any PARTY to this Agreement can withdraw from this Agreement upon all PARTIES agreeing to an amendment of AGREEMENT to remove the withdrawing PARTY from it. If one of the PARTIES elects to withdraw from cost sharing of the Special Study before the end of the term of this Agreement, it is agreed that the remaining cost share will be distributed among the other PARTIES based on the existing cost allocation formula. In the event of such Amendment, the withdrawing PARTY will be responsible for its share of implementation of the Special Study, and for payment of any fines, penalties or costs incurred by them as the result of non-performance of the Special Study.

Section 12. General Provisions

- a. Notices. Any notices, bills, invoices, or reports relating to this MOA, and any request, demand, statement or other communication required or permitted hereunder shall be in writing and shall be delivered to the Representative of the PARTY at the address set forth in Exhibit B. PARTIES shall promptly notify each other of any change of contact information, including but not limited to personnel changes, provided in Exhibit B. Written notice shall include notice delivered via email, reader notification requested, or confirmed fax. A notice shall be deemed to have been received on (a) the date of delivery, if delivered by hand during regular business hours, or by confirmed facsimile or by email; or (b) on the third (3rd) business day following mailing by registered or certified mail (return receipt requested) to the addresses set forth in Exhibit B.
- b. Administration. For the purpose of this MOA, the PARTIES hereby designate as their respective PARTY representatives the persons named in Exhibit B. The designated PARTY representatives, or their respective designees, shall administer the terms and conditions of this MOA on behalf of their respective PARTY. Each of the persons signing below on behalf of a PARTY represents

and warrants that they are authorized to sign this MOA on behalf of such PARTY.

- c. Relationship of Parties. The PARTIES are and shall remain at all times as to each other, wholly independent entities. No PARTY to this MOA shall have power to incur any debt, obligation, or liability on behalf of another PARTY unless expressly provided to the contrary by this MOA. No official, employee, agent, or officer of a PARTY shall be deemed for any purpose whatsoever to be an official, agent, employee or officer of another PARTY.
- d. Binding Effect. This MOA shall be binding upon and inure to the benefit of each PARTY to this MOA and its respective heirs, administrators, representatives, successors and assigns.
- e. Amendment. The terms and provisions of this MOA may not be amended, modified, or waived, except by an instrument in writing signed by all PARTIES who have not terminated their interests herein or whose involvement has not terminated by reason of non-payment or default.
- f. Waiver. Waiver by any PARTY to this MOA of any term, condition, or covenant of this MOA shall not constitute a waiver of any other term, condition, or covenant. Waiver by any PARTY to any breach of the provisions of this MOA shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this MOA.
- g. Law to Govern; Venue. This MOA shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the PARTIES, venue in the state trial courts shall lie exclusively in the County of Los Angeles.
- h. No Presumption in Drafting. The PARTIES to this MOA agree that the general rule that an MOA is to be interpreted against the PARTY drafting it, or the PARTY causing it to be prepared, shall not apply.
- i. Interpretation. All PARTIES have been represented by counsel in the preparation and negotiation of this MOA. Accordingly, this MOA shall be construed according to its fair language.
- j. Entire MOA. This MOA constitutes the entire agreement of the PARTIES with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.
- k. Severability. If any term, provision, condition or covenant of this MOA is declared or determined by any court or competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this Agreement shall not

be affected thereby and this MOA shall be read and constructed without the invalid, void, or unenforceable provision(s).

- I. Counterparts. This MOA may be executed in any number of counterparts, each of which shall be an original, but all of which taken together shall constitute but one and the same instrument, provided, however, that such counterparts shall have been delivered to all PARTIES to this MOA.

IN WITNESS WHEREOF, the PARTIES hereto have caused this MOA to be executed by their duly authorized representatives and affixed as of the date of signature of the PARTIES:

CITY OF CARSON

Date: _____

By: _____
Albert Robles
Mayor

ATTEST:

By: _____
Jim Dear
City Clerk

APPROVED AS TO FORM:

.....
City Attorney

By: _____

CITY OF LONG BEACH

Date: _____

By: _____

ATTEST:

By: _____
Deputy City Clerk

APPROVED AS TO FORM:

.....
City Attorney

By: _____

CITY OF LOS ANGELES

Date: _____

By: _____
Kevin James, President
Board of Public Works

ATTEST:

By: _____
XXX
City Clerk

APPROVED AS TO FORM:

.....
City Attorney

By: _____

CITY OF TORRANCE

Date: _____

By: _____
Patrick J. Furey

ATTEST:

By: _____
Rebecca Poirier, City Clerk

APPROVED AS TO FORM:

JOHN L. FELLOWS III
City Attorney

By: _____
John L. Fellows III

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

Malcolm Dougherty
Director

Date: _____

By: _____

Carrie L Bowen
District Director

APPROVED AS TO FORM &
PROCEDURE:

CERTIFIED AS TO FUNDS:

By: _____
Attorney

By: _____
District Budget Manager

CERTIFIED AS TO FINANCIAL
TERMS AND CONDITIONS:

By: _____
Accounting Administrator

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

By _____
MARK PESTRELLA
Chief Engineer

_____ Date

APPROVED AS TO FORM:

Mary C. Wickham
County Counsel

By _____
Deputy

_____ Date

COUNTY OF LOS ANGELES

By _____
MARK PESTRELLA
Director of Public Works

Date

APPROVED AS TO FORM:

Mary C. Wickham
County Counsel

By _____
Deputy

Date

EXHIBIT A

Dominguez Channel Estuary Bathymetry and Sediment Transport Study Responsible Parties Funding Contributions

Table 1: Total Cost Estimate.

CSMP Contract Cost	\$387,929
Contract Administration	\$19,396
TOTAL COST	\$407,325
TOTAL COST WITH 5% CONTINGENCY	\$427,692

Table 2: Cost Allocation Formula.

$$\text{Total Cost}^1 = ((\text{Contract Cost} - \text{LACFCD Allocation}) \times \text{Responsible Parties' Percent of Total Area}) + 5\% \text{ Administration Cost}$$

(1) Applies to Cities and County but not LACFCD

Table 3: Distributed Cost Among CSMP Responsible Parties.

Responsible Party	Total Area in Watershed [acres]	Responsible Parties Percent of Total Area	Allocated Contract Cost	Contract Administration Cost (5 Percent)	Total Cost	Total Cost with 5% Contingency
LACFCD ¹	N/A		\$19,396	\$970	\$20,366	\$21,385
Carson	10,755.92	49.03%	\$180,681	\$9,034	\$189,715	\$199,201
Long Beach	442.65	2.02%	\$7,436	\$372	\$7,808	\$8,198
Los Angeles	3,398.44	15.49%	\$57,088	\$2,854	\$59,942	\$62,940
Torrance ²	3,733.67	17.02%	\$62,719	\$3,136	\$65,855	\$69,148
Caltrans	714.30	3.26%	\$11,999	\$600	\$12,599	\$13,229
County of Los Angeles	2,893.70	13.19%	\$48,609	\$2,430	\$51,040	\$53,592
Total	21,938.68	100.00%	\$387,929	\$19,396	\$407,325	\$427,692

Notes:

(1) LACFCD will contribute 5% of the overall cost

(2) City of Torrance has 3 sump areas with no outlets. These were removed from the calculation

EXHIBIT B

Dominguez Channel Estuary Bathymetry and Sediment Transport Study Responsible Parties Representatives

1. City of Carson
Department of Public Works
Engineering Division
701 E. Carson St.
Carson, CA 90745

Party Representative: Maria Slaughter
E-mail: MSlaughter@carson.ca.us
Phone: 310-952-1700 X 1754
Fax: 310-835-5749

2. City of Long Beach
Department of Public Works
333 W. Ocean Blvd., 9th Floor
Long Beach, CA 90802

Party Representative: Alvin Papa
E-mail: Alvin.Papa@longbeach.gov
Phone: 562-570-6386

3. City of Los Angeles
Department of Public Works
Bureau of Sanitation, Watershed Protection Division
1149 S. Broadway
Los Angeles, CA 90015

Party Representative: Shahram Kharaghani
E-mail: Shahram.Kharaghani@lacity.org
Phone: (213) 485-0587
Fax: (213) 485-3939

4. City of Torrance
Department of Public Works
20500 Madonna Avenue
Torrance, CA 90503

Party Representative: John Dettle
E-mail: jdettle@TorranceCA.gov
Phone: (310) 618-3059

5. California Department of Transportation
100 S. Main St. Suite 100, MS 13
Los Angeles, CA 90012

Party Representative: Shirley Pak
E-mail: Shirley.Pak@dot.ca.gov
Phone: (213) 897-7546

6. Los Angeles County Flood Control District
Department of Public Works
Stormwater Compliance Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803-1331

Party Representative: Paul Alva
E-mail: PALVA@dpw.lacounty.gov
Phone: (626) 458-4325
Fax: (626) 457-1526

7. County of Los Angeles
Department of Public Works
Stormwater Compliance Division, 11th Floor
900 South Fremont Avenue
Alhambra, CA 91803-1331

Party Representative: Paul Alva
E-mail: PALVA@dpw.lacounty.gov
Phone: (626) 458-4325
Fax: (626) 457-1526

EXHIBIT C

Dominguez Channel Bathymetry and Sediment Transport Study SCOPE OF WORK



600 Wilshire Blvd, Suite 400
Los Angeles, CA 90017
tel: 213 457-2200
fax: 213 627-8295

March 10, 2017

Ms. Hoan Tang
Watershed Management Division
Los Angeles County Department of Public Works
900 S. Fremont Avenue, 11th Floor
Alhambra, CA 91803

Subject: **Proposal for Dominguez Channel Estuary Bathymetry and Sediment Transport Special Study**

Dear Ms. Tang:

CDM Smith is pleased to submit this revised letter proposal to provide technical services to perform a Special Study of the Dominguez Channel Estuary (DCE) for the Los Angeles County Department of Public Works (LACDPW), as described in the Scope of Work, dated October 19, 2016. This proposal addresses the requirements of the Special Study, including a bathymetric survey, data analysis, and sediment transport analysis for the Dominguez Channel Estuary for the CSMP Group, which comprises: County of Los Angeles, Los Angeles County Flood Control District (LACFCD), California Department of Transportation (CALTRANS) and the Cities of Carson, Los Angeles, Long Beach and Torrance. The Dominguez Channel Estuary is a flood control channel operated and maintained by the LACFCD, although it does not own the entire channel.

In 2016, the CSMP Group submitted the Revised Contaminated Sediment Management Plan: Dominguez Channel Estuary (CSMP). The CSMP outlines actions that will be taken to support reduction in legacy sediment contamination in the Dominguez Channel Estuary. The CSMP identifies a number of Special Studies to help inform the CSMP Group on how to proceed with implementing the CSMP. One of the Special Studies is the Bathymetry and Sediment Transport.

The objectives of implementing this scope of work are as follows:

1. *Perform Bathymetric Survey:* The bathymetric survey will determine sub-surface sediment elevations, which will be compared with channel invert elevations, to estimate sedimentation in Dominguez Channel Estuary. Results from the bathymetry survey will be used to calibrate the sediment accumulation model.

2. *Flow and Sediment Monitoring:* Flow and sediment data will be used to estimate sediment loading in the estuary in dry weather and wet weather conditions. Results from monitoring activities will be used to calibrate the sediment accumulation model.
3. *Sediment Accumulation Modeling:* A sediment accumulation model will be developed to estimate the average annual sediment accumulation rate within the estuary, using recent data obtained through Task 3 and Task 4 as specified in this proposal, as channel as-built drawings and the 2006 bathymetric survey conducted by the Port of Los Angeles.
4. *Sediment Remediation Plan:* Up to three scenarios will be evaluated to determine potential sediment remediation plans to prevent undesirable sediment buildup in the estuary.

The purpose of this proposal is to provide the CSMP Group with a detailed scope of work, schedule and budget for implementation of the proposed project. This information, along with key personnel, are provided below.

Proposed Scope of Work

To complete above objectives noted above, the CDM Smith Team proposes to implement the following Scope of Work:

Task 1: Project Management, Coordination, and Meetings

The following subtasks will be implemented to support Task 1.

Subtask 1.1 – Project Kick-off Meeting

Following receipt of a Notice to Proceed, the CDM Smith Team will organize a kick-off meeting to be held at LACDPW offices in Alhambra, CA. The focus of this meeting will be on the development of a project schedule and coordination and implementation of data collection activities (e.g., discussion of sites, sampling protocols, sample schedule). The kickoff meeting will include discussion of all project tasks. The CDM Smith Team will work with the LACDPW Project Manager on development of a meeting agenda and meeting materials.

Subtask 1.1 Deliverables

- Project Kick-off Meeting Agenda (electronic deliverable)
- Project Kick-off Meeting Summary (electronic deliverable)
- Project Schedule (electronic deliverable)

CDM Smith fee estimate for Subtask 1.1: \$3,176

Subtask 1.2 – Additional Project Meetings

Meetings and communication with the LACDPW Project Manager will occur throughout the duration of the study on an as-needed basis. At a minimum, the CDM Smith Team will conduct three status update meetings with LACDPW at the Public Works' headquarters in Alhambra, California to discuss project findings and steps forward. These meetings will occur as follows:

- One (1) meeting after final approval of the work plan, but prior to any field sampling activities
- One (1) meeting following the completion of all sampling activities
- One (1) meeting following the completion of the Draft Report

The CDM Smith Team will also attend meetings with the LACDPW Project Manager and the CSMP Group. In addition, the CDM Smith Team will attend a meeting with other Project stakeholders, including the Ports of Los Angeles and Long Beach, the Regional Board, and other regulatory agencies.

The budget includes attendance for a total of 4 required and 4 optional meetings by one CDM Smith team member. Everest will also attend up to three meetings to present their results from the sediment accumulation model. Potential purposes for these meetings include presentation and discussion of: (a) data collection results, (b) modeling approach, and (c) CSMP Group's comments on the draft deliverables.

Prior to the project meetings, the CDM Smith Team will prepare a draft meeting agenda at least five business days in advance of the meeting for LACDPW Project Manager review. A revised meeting agenda will be prepared and submitted at least two business days before the scheduled meeting. The CDM Smith Team will be responsible for bringing copies of the agenda and any handouts to the project meeting.

The CDM Smith Team will submit a draft meeting summary to the LACDPW Project Manager within five business days of the project meeting for review. The summary will include any meeting decisions or action items. Based on LACDPW comments, a final meeting summary will be provided.

Subtask 1.2 Deliverables

- Meeting Summaries (electronic deliverable)

CDM Smith fee estimate for Subtask 1.2: \$9,728

Task 1 Assumptions

- CDM Smith has included not only meeting attendance for up to 2 hours per meeting, but also meeting preparation, coordination, meeting summaries, and follow-up discussion with LACDPW following meetings. In our experience, there are other activities and documentation involved beyond the actual meetings themselves that are associated with meetings as opposed to other tasks.
- These meetings will be held at LACDPW offices in Alhambra, CA.

Task 1 Deliverables

- Project schedule (electronic deliverable)
- Meeting agendas, presentations, and summary notes (electronic deliverable)

Task 1 Fee Estimate

- CDM Smith fee estimate for Task 1: \$12,900

Task 2: Work Plan

The CDM Smith Team will prepare a work plan that details Task 3 (Bathymetric Survey) and Task 4 (Continuous Suspended Sediment Probes). The work plan will describe the methods for collecting field data and the methodology to be used for sediment modeling analysis. A draft of the Work Plan will be prepared for review by LACDPW Project Manager. Comments will be incorporated into a final Work Plan.

The Work Plan will include and not be limited to the following:

- Introduction including project background, regulatory background, study objectives and assumptions
- Summary of previous relevant studies and historical data
- A sampling plan (e.g., locations, frequency of sampling, analytical methods, and data analysis methods) to be employed as part of the study. The work plan will leverage planned monitoring activities by the TMDL Coordinated Integrated Monitoring Program (CIMP) for the Dominguez Channel Watershed Management Area to the maximum extent feasible in order to maximize cost efficiency and data comparability.
- Flow measurement procedures
- Sediment probe calibration procedures
- Data analysis approaches (summary of how the data will be used)

Mobilizing for the survey event includes coordinating equipment, project planning and meeting time, working with the project team to attain site access and/or issue notifications of survey operations, and configuring a survey vessel to implement one of the two options identified in Task 3.2 as the primary survey method.

Subtask 3.1 Deliverables

- Summary of site inspection (electronic deliverable)

CDM Smith fee estimate for Task 3.1: \$5,640 (including \$2,000 of permit fees)

Subtask 3.2 Bathymetric Survey & Reporting

The CDM Smith Team proposes two available survey options that meet the data quality objectives of the special study, assuming the site is accessible by boat and is deep enough to support the collection equipment: a single beam only approach and a multi-beam/single beam approach. Both survey options will require multiple consecutive dry weather days for completion and are presented below. Only one, not both, of the approaches will be used to survey any section of Dominguez Channel. However, if a section of Dominguez Channel allows for the multi-beam approach, the multi-beam approach will be used instead of the single beam approach. As such, it is possible that both approaches will be used to survey the entire length of Dominguez Channel Estuary.

Subtask 3.2.1 Single Beam Bathymetric Survey

In a single beam only approach, the CDM Smith Team will configure an aluminum Jon boat style work boat to perform repeated acoustic transects within the Dominguez Channel area. A Dual Frequency (DF) 200 to 30 KHz single beam sonar will be fix-mounted to the vessel and georeferenced using a real-time corrected differential GPS (e.g., Trimble or equivalent). The single beam depth resolution is 1.0 cm. Acoustic transects will be performed along the channel edges, within the center of the channel, and equidistant along the channel to grid the channel bottom. The single beam sonar provides a DF ping that can penetrate the surface layer of material, while simultaneously resolving high accuracy depth information, helping with bottom type characterization.

The single beam method will take approximately 5 survey days (two staff working 8 hours each day, total of 80 hours) to complete the DC survey using the single beam approach. Using a single beam method, more time must be spent running multiple transects to provide a greater number of points for raster interpolation. An additional 20 hours for two staff is required to process the single beam data (a total of 40 hours).

CDM Smith fee estimate for Task 3.2.1 Cost Estimate: \$14,380

- Health and safety protocols including confined space entry

The CDM Smith Team will secure all necessary permits prior to conducting any work in Dominguez Channel Estuary, including but not limited to a no-fee access permit and a construction permit

Task 2 Deliverables

- Draft and Final Work Plan (electronic deliverables) - Revisions to the draft Work Plan will be made, and comments addressed for the final Work Plan. The final Work Plan will include a summary of responses to comments.

Task 2 Cost Estimate

- CDM Smith fee estimate for Task 2 \$11,040

Task 3: Bathymetric Survey

The CDM Smith Team will conduct a bathymetric survey for the length of the Dominguez Channel Estuary to determine the current channel bed elevations. The channel bed data will be used for sub-surface sediment evaluations (see Task 6). The survey area will encompass the Dominguez Channel waterway north of the Port of Los Angeles (POLA) to at least the south of the Artesia Bus Terminal. The team will also attempt to survey down to the drop structure near Vermont Avenue. The final survey extent will be finalized during the pre-survey site inspection (see Task 3.1). These results will be compared to the channel invert elevations determined from channel as-built drawings as well as against a previous bathymetric survey conducted by the Port of Los Angeles in 2006.

The CDM Smith Team suggests a dynamic approach to the bathymetric data collection for the Dominguez Channel based on safe working conditions, equipment capabilities, and logistical constraints of the site. The survey plan will capture data appropriate in scale and resolution to support special study objectives. Our approach is based on communicating results, developing team concurrence, and meeting the goals and objectives of the special study. Listed here are expected tasks for the bathymetric data collection effort

Subtask 3.1 Pre-Survey Site Inspection and Mobilization

The CDM Smith Team will conduct an inspection of the survey area to assess the safety of accessing the site, identify hazards (booms, rockpiles, shoals, etc.) to the survey crew, and make a preliminary evaluation of the feasibility of introducing high resolution equipment types (e.g., multi-beam and/or Side Scan Sonars) into the survey program. The inspection will involve launching a boat into the Dominguez Channel; therefore, the team will obtain an access permit prior to the inspection. In 2006, the POLA construction office could get a boat and multi-beam into the channel to survey certain parts of the channel, but because over a decade has passed since those surveys, we believe it would be prudent to re-evaluate the site and make sure this is still the case

Subtask 3.2.2 Multi-beam Bathymetric Survey (Optional)

If the pre-survey inspection (Task 3.1) indicates the feasibility to collect multi-beam data in the channel, the team will mobilize the same Jon boat style vessel as described under Task 3.2, but use a Reson T50 and perform a multi-beam survey to a predetermined safe location within the Dominguez Channel. Based on previous experience, the CDM Smith Team assumes only a portion of the Dominguez Channel can be surveyed using a multi-beam. This approach is slightly more costly than single beam survey, but surveying times for the multi-beam areas will be reduced.

The multi-beam method anticipates taking 3 survey days (two staff working 10 hours each day, total of 60 hours) with the multi-beam. The T50 has a maximum resolution of 6.0 mm. More processing time is required and the equipment is more expensive, but the areas that are surveyed with the multi-beam can expect to realize better than 90 percent bottom coverage. A total of 43 hours for two staff is required to process the multi-beam data.

CDM Smith fee estimate for Task 3.2.2 Cost Estimate: \$20,690

Subtask 3.2 Deliverables

- Microstation and GIS files (electronic deliverable)

CDM Smith fee estimate for Task 3.2: \$35,070

Subtask 3.3 Reporting

The CDM Smith Team will calculate sediment removal volumes based on the as-built drawings, 2006 bathymetric data, and the bathymetric data collected under this scope of work. The CDM Smith Team will prepare a memorandum that documents quantity of sediment accumulation since the channel was constructed and since the POLA survey compared to current conditions.

Subtask 3.3 Deliverables

- Memorandum (electronic deliverable)

CDM Smith fee estimate for Task 3.3: \$11,430

Task 3 Assumptions

- At a minimum a resolution of 5-foot grid spacing
- CDM Smith will obtain appropriate permits prior to conducting the survey
- Available information: Previous bathymetric survey and storm drain as-built drawings

Task 3 Responsibilities

- Pi Environment will conduct the bathymetric survey with technical input from Everest and CDM Smith.
- CDM Smith will perform the comparison between the bathymetric survey results and the channel as-built drawings and previous survey.

Task 3 Deliverables

- Memorandum documenting survey results and comparison to channel as-built drawings and previous survey (2006) (electronic deliverable)
- Microstation and GIS files (electronic deliverable)

Task 3 Cost Estimate

- CDM Smith fee estimate for Task 3 with single-beam bathymetric option: \$52,140 (including both bathymetric survey approach options)

Task 4: Continuous Suspended Sediment Probes

The CDM Smith Team will collect total suspended solids (TSS) samples and install continuous suspended sediment (turbidity) probes and flow measurement devices at eight sites in Dominguez Channel Estuary to estimate the amount of sediment entering the estuary. The suspended sediment probes and flow devices will be installed at significant outfalls to estimate sediment loads transported along Dominguez Channel Estuary. TSS collection will be conducted prior to the monitoring period to establish a correlation between total suspended solids and probe readings. The sites will include (**Table 1**):

- One monitoring site located upstream of Dominguez Channel Estuary, where the concrete portion of the channel transitions to the unlined estuary. This will represent the input entering the estuary.
- One monitoring site located at Torrance Lateral before confluence with the Dominguez Channel Estuary.
- One monitoring site located at the downstream end of Dominguez Channel Estuary, where the estuary transitions to the Port of Los Angeles.
- Five monitoring sites located at storm drain outfalls between the upstream and downstream sites. These five monitoring sites will be located at major outfalls or tributaries to the estuary. The Dominguez Channel CIMP will be used as a guidance document for selecting these five monitoring sites.

Table 1 Tentatively Proposed Monitoring Sites

Monitoring Site	Description
1 – Dominguez Channel Estuary Upstream	Upstream end of DCE where concrete section transitions to unlined estuary
2 – Torrance Lateral	Torrance Lateral near Vermont Ave and Torrance Blvd (DOM-OF-002 in the CIMP)
3 to 7 – To be determined	To be determined during site investigation
8 – Dominguez Channel Estuary Downstream	Downstream end of DCE where estuary transitions to Port of Los Angeles

Subtask 4.1 Site Investigation

With guidance from LACDPW and the LACDPW GIS information regarding outfalls and drainage areas, the CDM Smith Team will propose eight monitoring locations along Dominguez Channel Estuary for sediment measurements. These eight sites include locations upstream of the Estuary, Torrance Lateral, and at the transition to the Port of Los Angeles. The CDM Smith team will conduct a field reconnaissance at the proposed locations and major outfalls to determine if site conditions are conducive to sample collection and probe installation. During the field reconnaissance, the team will evaluate the representativeness of the sites, feasibility for probe installation, safety concerns, and accessibility.

Subtask 4.1 Deliverables

- Summary of site investigation (electronic deliverable)

CDM Smith fee estimate for Subtask 4.1: \$3,760

Subtask 4.2 Suspended Sediment and Flow Probes Installation and Maintenance

The CDM Smith Team, which consists of three persons to comply with confined space entry requirements, will install continuous suspended sediment probes and flow measurement sensors (area velocity sensors and ultrasonic level sensors) at the eight proposed locations entering the Dominguez Channel Estuary. At locations where traffic control may be required (e.g., manhole in an intersection), a traffic control subcontractor will be used to provide safe access to the site for the CDM Smith Team. This may include lane closure, cone placement, signage, or other services to be determined during the site investigation (Task 4.1) and documented in the Work Plan (Task 2).

Measurements will be recorded continuously at a 15-minute interval (or shorter) over a six-month monitoring period that encompasses the wet season. As the wet season is typically defined as October 1 through March 31, the proposed monitoring period will begin October 1 and conclude on March 31.

Flow Measurements

Flow measurements will be collected using area velocity sensors and ultrasonic level sensors provided by LACDPW. Temporary stakes will be installed at the upstream and downstream estuary sites to mark cross-sections at monitoring sites and markers will be used to identify stream depth visually during monitoring events and inspections. Area velocity sensors will be used at the upstream and downstream Dominguez Channel Estuary sites while ultrasonic level sensors, to measure stream stage, will be installed at the remaining six sites to obtain continuous measurements over a range of flow and weather conditions.

The six remaining sites monitored by ultrasonic level sensors will be located at major outfalls to be selected during the site investigation. V-notch or compound weir plates sized to capture low flow as well as a range of flows expected will be temporarily installed with the level sensors (or equivalent) at the outfalls. Water levels measured by the ultrasonic level sensors will be used to estimate flowrates by applying standard weir equations.

The CDM Smith Team will be responsible for the temporary installation of all equipment in Dominguez Channel Estuary (area velocity sensors, ultrasonic level sensors, weirs, etc) prior to the start of the monitoring period. Installations, including weirs, will not interfere with any existing infrastructure established under the Dominguez Channel CIMP. Prior to installation, ultrasonic level sensors will be inspected and calibrated by the manufacturer, US³ Incorporated. Upon completion of the monitoring period, the CDM Smith Team will uninstall all equipment and return area velocity and ultrasonic level sensors to LACDPW.

Turbidity Measurements

Turbidity levels (NTU) measured by turbidity probes (YSI 6920 or equivalent) installed at each site will be converted to daily suspended sediment discharge (tons/day) through application of streamflow data and correlations with TSS. TSS samples will be collected at each site over a range of conditions to develop site-specific linear correlations between turbidity probe readings and TSS concentrations (mg/L) for both dry and wet weather conditions, respectively. Correlations will be established for both dry and wet weather conditions prior to the start of the monitoring period. During one dry weather and one wet weather day, autosamplers will be used to collect up to 24 samples over 24 hours from each monitoring site with corresponding turbidity measurements recorded by probes. Wet weather conditions are defined as a minimum of 0.25 inches of precipitation during the wet season.

Maintenance

Throughout the monitoring period, the CDM Smith Team will conduct bimonthly site visits to maintain the probes, which includes repairing, calibrating, and cleaning the probes as needed. Maintenance will also be conducted prior to the start of each monitoring event. The CDM Smith Team

will download data from the probes during all maintenance and monitoring events and at the conclusion of the monitoring period.

Data from the probes will be collected from the major outfalls and processed to obtain sediment and flow data. Using flow measurements, the sediment load entering the estuary from the major outfalls will be determined.

CDM Smith fee estimate for Subtask 4.2: \$75,320 (including \$38,500 of equipment cost and traffic control subcontractor costs of \$6,210)

- Equipment cost includes: rental of eight YSI 6920 turbidity sensors, Cricket ultrasonic level sensor subscription fees for six sensors for six months, six Cricket ultrasonic level sensor batteries.
- Traffic control subcontractor cost includes a standard 2-page traffic control plan and six day of unmonitored lane closure during standard work hours (Monday through Friday between 7 AM and 4 PM). This assumes two days of traffic control required for installation and four days of traffic control required for calibration event set up and tear down. The eight-hour work day includes travel time to and from the subcontractor's office. If traffic control is required outside of standard work hours, overtime cost will be incurred at a rate of \$70 per hour per technician. Final subcontractor scope of work is subject to change pending site investigations with the LACDPW staff.

Subtask 4.2 Deliverables

- Data from flow and turbidity probes (electronic deliverable)

Subtask 4.3 Field Deployment

The CDM Smith Team will collect up to 24 TSS samples from five of the eight monitoring locations in the Dominguez Channel Estuary during up to one dry weather and two wet weather events, as detailed in the Work Plan developed under Task 2. Wet weather is defined as days when 0.25 inches or more of rain is measured by nearby rain gages and dry weather is defined as no measurable rain within 72 hours prior to sampling. If rain is measured by any nearby LACDPW rain gages, dry weather sampling will not occur until a minimum of 72 hours has passed. TSS samples will be delivered within holding time requirements to the contract laboratory for analysis.

The CDM Smith Field Team will consist of three persons, who will temporarily install autosamplers at the subset of five monitoring sites to collect time-weighted samples (dry weather) or flow-weighted samples (wet weather) from each site. The field team will remove autosamplers and download all flow and turbidity data from each site at the conclusion of each monitoring event. During monitoring events at locations where traffic control may be required (e.g., manhole in an

intersection), a traffic control subcontractor will be used to provide safe access to the site for the CDM Smith Team, as described in Task 4.2.

While on site during the monitoring events, the CDM Smith Team will also take temperature and pH measurements from each site using digital meters (YSI Model 60 or equivalent) as well note visual observations from each site. Field measurements will be logged on project field forms, which should include date and time of sampling, site ID, sample ID, names of staff, and all field measurements and notes. Field staff will also take photos and estimate flow at each site during each monitoring event. Field notes include any pertinent events or observations occurring during any sampling period that may potentially impact sampling results.

The CDM Smith Team will download turbidity data from all continuous suspended sediment probes every month in addition to during monitoring events.

Table 2 Summary of Field Deployment

Number of Monitoring Sites	Eight (continuous monitoring) Five (wet and dry weather events)
Number of Water Samples per Site per Event	Up to 24
Number of Dry Weather Events	1
Number of Wet Weather Events	2
Duration of Continuous Monitoring	Six months through the wet season (approximately October through March)
Continuous Monitoring Parameters	Turbidity Flow
Water Sample Constituents	Total suspended solids

Subtask 4.3 Deliverables

- Post dry and wet weather monitoring reports, with field data sheets and lab results (electronic deliverable)

CDM Smith fee estimate for Subtask 4.3: \$43,590 (including \$12,715 of equipment cost and traffic control subcontractor cost of \$5,610)

- Equipment cost includes: rental of six ISCO 6712 autosamplers for three monitoring events
- Traffic control subcontractor cost includes six days of unmonitored lane closure during standard work hours (Monday through Friday between 7 AM and 4 PM). This assumes six days of traffic control required for monitoring event set up and tear down for the three monitoring events. The eight-hour work day includes travel time to and from the

subcontractor's office. If traffic control is required outside of standard work hours, overtime cost will be incurred at a rate of \$70 per hour per technician. Final subcontractor scope of work is subject to change pending site investigations with the LACDPW staff.

Subtask 4.4 Technical Memorandum

The CDM Smith Team will prepare a technical memorandum that summarizes the methodology, monitoring activities, results and sediment loading from the monitoring period.

Subtask 4.4 Deliverables

- Memorandum (electronic deliverable)

CDM Smith fee estimate for Subtask 4.4: \$15,190

Subtask 4.5 Additional Installation and Monitoring (Optional)

The CDM Smith Team will procure and install additional sensors or parts as needed during the monitoring period. This includes weirs to supplement flow measurements and replacement probes. If an already installed probe cannot be maintained on site, the CDM Smith Team will coordinate with the manufacturer for maintenance needs. In the event that the LACDPW probe must be taken offline (e.g., due to vandalism or theft, offline maintenance), the CDM Smith Team will provide a replacement probe. If installations are located in manholes or other confined spaces that are subject to confined space entry requirements during monitoring events (Task 4.3), the CDM Smith field team for monitoring events will include a third member to meet safety requirements.

CDM Smith fee estimate for Task 4.5 Cost Estimate: \$25,990 (including \$5,000 of equipment cost)

- Equipment cost includes rental of two replacement probes for two months each

Task 4 Responsibilities

- CDM Smith will activate, install/uninstall, and maintain the sensors provided by LACDPW. Upon completion of the monitoring period, CDM Smith will return the area velocity and ultrasonic level sensors to LACDPW.
- CDM Smith will lead on Task 4 by collecting water samples, performing flow measurement, calibrating and installing/uninstalling sediment probes. CDM Smith will evaluate the data quality and completeness, compile the data, and export the data in the format preferred by LACDPW. Everest will review the field, chemistry and sediment data from CDM Smith to ensure required data is available for Task 5 Sediment Accumulation Model.

Task 4 Deliverables

- Memorandum summarizing the monitoring efforts, including TSS and sediment loading results (electronic deliverable)
- YSI field measurement data, TSS and turbidity data, compatible with LACFCD format to be supplied by LACFCD (electronic deliverable)

Task 4 Cost Estimate

- CDM Smith fee estimate for Total Cost for Task 4: \$162,900 (including equipment costs, laboratory analysis costs, and traffic control cost)

Task 5: Sediment Accumulation Model

The CDM Smith Team will conduct sediment transport modeling of the Dominguez Channel Estuary to estimate an average annual sediment accumulation rate within the Dominguez Channel Estuary. Modeling will be consistent with prior work conducted for the Port of Long Beach and the Port of Los Angeles (the Ports) for the Toxics TMDL.

The CDM Smith Team proposes a phased approach for conducting the sediment accumulation modeling. The CDM Smith Team will first conduct a preliminary model simulation using previously developed methodologies for the Ports in estimating sediment loadings to Dominguez Channel Estuary from the watershed using updated data. A data analysis will be conducted to incorporate newer data from ongoing monitoring programs including the Enhanced Watershed Management Programs (EWMPs), LACFCD's mass emission station, and the CIMPs, to the extent practical. While the CIMP includes few monitoring events at one site, there is an additional site planned that will be reviewed for data incorporation. The CDM Smith Team Project Manager will coordinate with LACDPW to incorporate all available data. The initial model results will be compared with the estimated sedimentation rate at Dominguez Channel Estuary using the analyzed bathymetry data upon the completion of Task 3, and the model will be adjusted if necessary. Lastly, upon the completion of Task 4, the method developed for the Ports in estimating sediment loading from the Dominguez Channel watershed will be modified using the flow and sediment data collected under Task 4, and a final model validation simulation will be conducted based on the results of Tasks 3 and 4.

Once validated, the model will be used to estimate an "average" sediment accumulation rate at Dominguez Channel Estuary. Since sediment loadings can vary substantially year-to-year depending on hydrological conditions, it is anticipated that model simulations will be conducted for a multi-year duration (e.g., 10 to 20 years) such that an "average" sediment accumulation rate can be estimated.

Task 5 Deliverables

- Technical memorandum summarizing the modeling methods (setup and parameters) and results for estimating the average sediment accumulation rate at the Dominguez Channel Estuary (electronic deliverable)

Task 5 Cost Estimate

- CDM Smith estimates the Total Cost for Task 5: \$85,360

Task 6: Sediment Remediation Cost and Schedule

Using the accumulation data from Task 3, and if authorized the sediment quality data from Task 8, the CDM Smith Team will evaluate typical sediment remediation methodologies, their advantages and disadvantages, and how they would be applied for this project. In addition, the CDM Smith Team will prepare a planning level cost for each methodology as well as a schedule for each methodology. The CDM Smith Team will provide LACDPW with a recommendation memorandum detailing potential recommendations for remediation options to address the sediment and contamination. This separate memorandum will be submitted with the final report prepared under Task 7.

Task 6 Assumptions

- Volumes and remediation methodology will be based on past monitoring data regarding the quality of the sediment.

Task 6 Deliverables

- Two (2) hard copies and one (1) electronic copy of the Recommendation Memorandum documenting recommended methods for sediment removal as well as costs and schedule.

Task 6 Cost Estimate

- CDM Smith fee estimate for Task 6: \$24,350

Task 7 – Close-Out Final Report

The CDM Smith Team will provide LACDPW with a draft and final close-out report that incorporates the findings from Tasks 3 through Task 5 and optional Task 8. The CDM Smith Team will also prepare a PowerPoint presentation with the findings and will present it to the LACDPW staff during a final scheduled meeting. The CDM Smith Team will incorporate LACDPW comments on the draft report, discussed during the final meeting, into the final report.

Task 7 Deliverables

- Draft Close-Out Final Report (electronic deliverable)
- Two (2) hard copies and one (1) electronic copy of the Close-Out Final Report

- One (1) electronic copy of the Final Presentation

Task 7 Cost Estimate

- CDM Smith fee estimate for Task 7: \$15,990

Task 8 – Sediment Coring (Optional)

Under this task, the CDM Smith Team will collect and process sediment cores from the Dominguez Channel Estuary. The specific points of collection will be determined after bathymetric data collection (Task 3). Based on our conversation with the County, we understand sediment cores will be collected one time from eight (8) sampling locations. The new sediment quality information from the sediment cores will be evaluated and used to assess the quality of the sediment. Sediment cores will be analyzed for the constituents listed in Table 3, consistent with the TMDL for Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters.

As part of this task, the Team will mobilize and demobilize equipment, and provide the necessary supplies, caps, tubes, and other expendables to facilitate the collection process. The CDM Smith Team will mobilize a small support vessel, and the equipment necessary (i.e., spoons, tables, and decontamination supplies) to enable processing of the collected core samples while onsite. The Team will acquire the necessary access agreements for collection.

Using a small boat, field crews will collect push core samples at pre-determined stations within the Dominguez Channel. Processing, which includes logging, photographing, homogenizing and/or compositing the sediment samples, shall be conducted onsite with a small processing area set-up along the edge of channel to facilitate immediate processing of the samples for delivery to the analytical laboratory. The sediment collection and processing will require three (3) staff working 2 ten (10) hour days. Our estimate is that 4 to 6 cores can be collected and processed in a day, depending on material and processing methodology.

Upon completion of sediment coring, a technical memorandum will be prepared to summarize the sediment quality results.

Table 3 Summary of Sediment Core Coring

Number of Sediment Coring Sites	Eight
Type of Cores	Push cores
Number of Coring Events	One
Sediment Sample Constituents	Metals ▪ Cadmium ▪ Chromium ▪ Copper

	▪ Lead ▪ Mercury ▪ Zinc Organics ▪ Total Chlordane ▪ Dieldrin ▪ Toxaphene ▪ Total PCBs ▪ Benz[a]anthracene ▪ Benzo[a]pyrene ▪ Chrysene ▪ Pyrene ▪ 2-methylnaphthalene ▪ Dibenz[z,h]anthracene ▪ Phenanthrene ▪ High MW PAHs ▪ Low MW PAHs ▪ Total PAHs ▪ Total DDT Particle Size
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Task 8 Deliverables

- Memorandum summarizing the sediment quality results (electronic deliverable)
- Field logs, laboratory data sheets, and export the data in the format preferred by LACDPW. (electronic deliverable)

Task 8 Cost Estimate

- CDM Smith fee estimate for Task 8: \$23,310

Key Personnel

CDM Smith has selected a team of qualified staff and firms to execute this project. **Figure 1** illustrates the proposed organizational structure for this project. This structure is discussed below; brief biographies of the primary project personnel are provided in **Attachment A** of this proposal.

- **David Ebersold** will serve as the CDM Smith Principle-in-Charge for this Task Order. In this role, he is responsible for ensuring client expectations are met throughout the project.

- **Brian Murphy** will serve as the day-to-day Project Manager throughout project execution. He will provide technical direction and oversight of all tasks. He will be the point person for communications between the CDM Smith Team and LACDPW.
- **Keegan Roberts** will serve as a senior technical reviewer throughout the duration of the project, leveraging his expertise in water quality and sediment remediation.
- **Tiffany Lin** will lead water quality sampling and sediment and flow monitoring. She will work collaboratively with **LACDPW** to execute data collection and reporting requirements. Bathymetric surveying will be performed by Pi Environmental, under Tiffany Lin's direction.
- Modeling services will be provided by **Everest International Consultants, Inc.** (certified Minority Business Enterprise [MBE] and Small Business Enterprise [SBE]) in the City of Los Angeles) under the direction of Ying Poon. Everest staff will complete all modeling analyses and provide results to the CDM Smith Team.
- **John Newby** will oversee the sediment removal strategies. John led the sediment removal analysis for the Machado Lake Ecosystem Rehabilitation Project so he is well versed in methodologies and costs for sediment removal in the Los Angeles area.

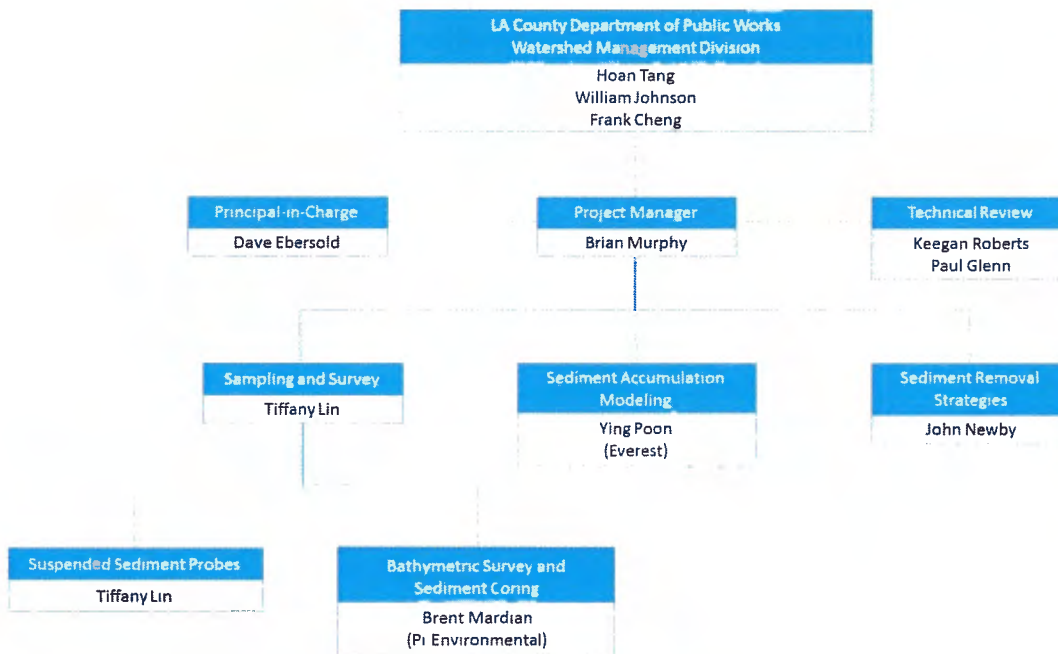


Figure 1 Project Team

Proposed Project Budget

Table 4 and **Attachment B** provides information regarding the CDM Smith Team's cost estimate to complete the services described above under Tasks 1 through 8.

The cost estimate without optional Tasks 8, sediment coring, is \$364,620. This includes cost for both proposed approaches for bathymetric survey. The cost estimate including optional task for sediment coring is \$387,930. Task 4 cost includes labor, monitoring events, equipment installation, laboratory testing, and equipment rental.

Attachment B includes a breakdown of labor hours by labor classification for CDM Smith staff, as requested by LACDPW. Supporting information from Pi Environmental and Everest on their scope of work and fees is also included.

Table 4 Summary of Proposed Project Budget

Task	Total Labor	Sub Contractor	Laboratory Cost	Grand Total
Task 1 - Project Management, Coordination & Meetings	\$9,700	\$3,200	\$0	\$12,900
1.1 Kickoff Meeting	\$2,820	\$356		\$3,176
1.2 Additional Project Meetings (8 Meetings)	\$6,880	\$2,844		\$9,728
Task 2 - Work Plan	\$8,640	\$2,400	\$0	\$11,040
2.1 Draft Work Plan	\$5,760	\$2,400		\$8,160
2.2 Final Work Plan	\$2,880			\$2,880
Task 3 - Bathymetric Survey	\$13,220	\$38,915	\$0	\$52,135
3.1 Pre-Survey Site Inspection and Mobilization	\$3,410	\$2,225		\$5,635
3.2 Bathymetric Survey	\$1,720	\$33,350		\$35,070
3.2.1 Single Beam Bathymetric Survey	\$860	\$13,520		\$14,380
3.2.2 Multi-Beam Bathymetric Survey (Optional)	\$860	\$19,830		\$20,690
3.3 Reporting	\$8,090	\$3,340		\$12,290
Task 4 - Continuous Suspended Sediment and Flow Monitoring Probes	\$141,920	\$11,820	\$9,108	\$162,848
4.1 Site Investigation	\$3,760			\$3,760
4.2 Installation and Maintenance	\$65,940	\$6,210	\$3,168	\$75,318
4.3 Field Deployment	\$32,040			\$43,590
4.4 Technical Memorandum	\$15,190	\$5,610	\$5,940	\$15,190
4.5 Additional Installation and Monitoring (Optional)	\$24,990			\$24,990
Task 5 - Sediment Accumulation Model	\$7,440	\$77,920	\$0	\$85,360
5.1 Model Development	\$1,720	\$62,336		\$64,056

5.2 Technical Memorandum	\$5,720	\$15,584		\$21,304
Task 6 Sediment Removal Cost & Schedule	\$24,350	\$0	\$0	\$24,350
6.1 Development of Sediment Removal Strategies	\$16,060			\$16,060
6.2 Technical Memorandum	\$8,290			\$8,290
Task 7 - Close Out Report	\$15,990	\$0	\$0	\$15,990
7.1 Draft Report	\$10,660			\$10,660
7.2 Final Report	\$5,330			\$5,330
Total (Task 1 through 7)	\$221,260	\$134,255	\$9,108	\$364,623
Task 8 - Sediment Coring (Optional)	\$6,610	\$8,820	\$7,876	\$23,306
8.1 Sediment Coring	\$1,880	\$8,820	\$7,876	\$18,576
8.2 Technical Memorandum	\$4,730			\$4,730
Total (Task 1 through 8)	\$227,870	\$143,075	\$16,984	\$387,929

Proposed Schedule

Table 5 provides a schedule for the execution of this project; this schedule will be refined as needed during the Project Kickoff Meeting (see Task 1.1). Key assumptions include:

- Notice to Proceed by February 28, 2017.
- Composite sediment sampling will occur whenever there is a runoff event. The data will be collected every other month.
- Bathymetric survey occurs in April 2017 depending on the water levels in the Dominguez Channel Estuary.
- The sediment accumulation modeling will start in early 2018 following completion of suspended sediment sampling.

Table 5 Proposed Project Schedule

Task	Subtask	Milestone Completed By
Task 1 – Project Management, Coordination, and Meetings	1.1 Kickoff Meeting	Within two weeks of notice to proceed
	1.2 Additional Project Meetings	Monthly, date TBD
	1.3 Project Schedule	Within two weeks of notice to proceed
Task 2 – Work Plan	2.1 Draft Work Plan	Within four weeks of notice to proceed
	2.2 Final Work Plan	Within eight weeks of notice to proceed

Ms. Hoan Tang
March 10, 2017
Page 21

Task 3 – Bathymetric Survey	3.1 Pre-Survey Site Inspection and Mobilization	March 2017
	3.2 Bathymetric Survey	March 2017
	3.3 Reporting	April 2017
Task 4 – Continuous Suspended Sediment and Flow Probes	4.1 Site Investigation	March 2017
	4.2 Installation and Maintenance	February - December 2017
	4.3 Field Deployment	December 2017
	4.4 Technical Memorandum	March 2018
Task 5 – Sediment Accumulation Model	5.1 Model Development	March 2018
	5.2 Technical Memorandum	April 2018
Task 6 – Sediment Removal Cost and Schedule	6.1 Development of Sediment Removal Strategies	February 2018
	6.2 Technical Memorandum	March 2018
Task 7 – Close Out Final Report	7.1 Draft Report	April 2018
	7.2 Final Report	May 2018
Task 8 – Sediment Coring (Optional)	8.1 Sediment Coring	March 2017
Task 9 – Multi-beam Bathymetric Survey (Optional)	9.1 Multibeam Bathymetric Survey	March 2017

Closing

Thank you for the opportunity to provide this proposal to conduct the Dominguez Channel Estuary Special Study. Our project team looks forward to discussing this proposal with you at your earliest convenience. If you have any questions, please contact me at egersolddb@cdmsmith.com or (213) 457-2139.

Very truly yours,



David B. Ebersold
Vice President
CDM Smith Inc

Attachment A: Biographies of Key Personnel

Brian Murphy, CDM Smith (Project Manager) - Mr. Murphy is a Principal Water Resources Engineer and have over 15 years of experience in water resources planning, engineering and design. He is a licensed professional engineer in California and is a certified Project Management Professional from the Project Management Institute. With a wide-ranging background in water resources, including hydraulic modeling, sediment transport and scour analysis, as well as stormwater management and watershed hydrology In recent years he has worked with LACDPW on the Neenach Flood Hazard project, and worked with the City of Los Angeles as a task manager on the Machado Lake Ecosystem Rehabilitation Project, including the development of sediment removal and BMPs.

Keegan Roberts, CDM Smith (Senior Technical Advisor) - Dr. Roberts provides extensive experience in the fields of contaminated sediment assessment and remediation, including sediment and porewater sampling; sampling plan design and review; ebullition surveys, capping modeling, and dredge production, release, and residual projections. He has also worked extensively in the fields of coastal restoration and fluid mud management for both public and private clients. Dr. Roberts experience also includes general environmental engineering and contaminated site assessment and remediation. He has conducted numerous environmental site assessments for public and private clients; and overseen contaminated soil/sediment excavation, sampling, and disposal projects.

Tiffany Lin, CDM Smith (Sampling and Survey) - Dr. Lin brings her experience with stormwater projects, hydraulic and hydrologic modeling, and generation and analysis of water quality data to this project She is well versed in field and laboratory work and designing sampling and experimental plans, particularly regarding arsenic and bacteria contamination. She has hands on experience in implementing long-term water monitoring in agricultural regions of Bangladesh. Additionally, Dr. Lin has extensive leadership and mentoring experience through assistant teaching at UCLA, community outreach with K-12 children She currently serving as the project engineer on a number of water quality projects, including: Oxford Retention Basin Enhancement Project Pre-Construction Monitoring; Los Angeles County Parking Lot 7 Baseline Water Quality Monitoring; Los Angeles World Airports Stormwater Support Services, and Watershed-Wide Compliance Monitoring in the Middle Santa Ana River watershed

Brent Mardian, Pi Environmental (Bathymetric Survey) - Mr. Mardian has a uniquely multidisciplinary approach to marine environmental projects. Mr. Mardian has worked to apply his understanding of marine systems and to implement complex marine investigations into sediment, water, and sensitive biological resources. For over a decade, Mr Mardian has assisted both private and public sector clients in managing their sediment, water quality, and marine biological resources. Mr. Mardian's project experience includes Sediment Quality Objective sampling (SQO part 1 surveys), dredged material characterizations, beneficial reuse alternatives analysis in accordance with UTM/ITM and "Greenbook" sample collection and testing protocols, and he is certified by the NMFS and CDFW as a Caulerpa surveyor. Mr. Mardian has installed a real-time autonomous dredge water quality monitoring network for the Shipyards Sediment clean-up projects, and is the former project manager for the USACE LARE and POLA maintenance dredge water quality project, the POLB Pier G dredging water quality monitoring program, and POLA Main Channel dredge water quality monitoring programs. Additional water quality experience includes hydrographic model verification, sediment transport studies, real-time plume tracking, and support for a variety of receiving water and long-term water quality monitoring efforts. In 2010, Mr. Mardian was officially recognized by the



Attachment A: Biographies of Key Personnel

Port of Los Angeles Board of Directors for his work on dredge water quality monitoring with the POLA.

Ying Poon, Everest (*Sediment Accumulation Model*) – Dr. Poon is responsible for managing and directing coastal and hydraulic engineering projects. He has over 27 years of professional experience with coastal and hydraulic engineering studies and design projects. His experience includes the planning and design of shore and slope protections, harbor and port developments, river hydraulics and water resources studies, as well as wetland restoration designs. Dr. Poon is an expert in the application of numerical and physical models in solving complex coastal processes, harbor engineering and water resources planning projects. He has also developed and used a wide range of hydrodynamic and water quality models, analyzed tidal inlet stability, studied shoreline evolution and beach erosion, modeled wave transformation and wave-structure interactions. In addition, Dr. Poon is experienced in statistical modeling, spectral analysis, physical model design and interpretation of model results, as well as field investigation. Dr. Poon has instructed courses in Coastal Engineering and Introduction to Hydrology at the University of California, Irvine; as well as Hydraulic Design, Hydrology and Watershed Management at the California State University, Long Beach.

John Newby, CDM Smith (*Sediment Removal Strategies*) – John is a registered professional engineer with 40 years of experience in the civil engineering design and construction. His areas of expertise include static and dynamic foundation design, bulkhead and retaining wall design, slope stability analysis, driven and drilled pile foundation construction, soft ground tunnels, conveyance pipelines and pump stations, marine and river outfalls, earth dams and embankments, and dredging studies. Throughout his career, Mr. Newby has successfully managed complex, multi-phased projects. He has a proven ability to assemble and integrate professional staff, both within CDM Smith and from subconsultant firms, into a cohesive project team that delivers technical excellence. Mr. Newby has had responsibility for verifying that client objectives are achieved through broad-picture planning, large project team coordination, key decision making, risk management, resolution of conflicts and disputes, and consensus building. Mr. Newby is also skilled at presenting technical information in a clear and concise manner to a wide range of lay, technical, and public audiences.

Attachment B: Project Cost Estimate

Task	Senior Project Principal	Senior Project Manager	Principal Scientist/Engineer	Senior Scientist/Engineer	Staff Engineer/Planner	Assistant Engineer/Planner	Admin Support	Project Controls	Total Hours	CDM Smith	Sub Contractor	Laboratory Cost	Grand Total
Task 1 - Project Management, Coordination & Meetings													
1.1 Kickoff Meeting	2	42	0	0	0	0	2	0	46	\$9,700	\$3,200	\$0	\$12,900
1.2 Additional Project Meetings	2	10					2		14	\$2,820	\$356		\$3,176
1.2.1 Status Meeting 1		32							32	\$6,880	\$2,844		\$9,728
1.2.2 Status Meeting 2		4							4	\$860	\$356		\$1,216
1.2.3 Status Meeting 3		4							4	\$860	\$356		\$1,216
1.2.4 Status Meeting 4		4							4	\$860	\$356		\$1,216
1.2.5 Status Meeting 5 (Optional)		4							4	\$860	\$356		\$1,216
1.2.6 Status Meeting 6 (Optional)		4							4	\$860	\$356		\$1,216
1.2.7 Status Meeting 7 (Optional)		4							4	\$860	\$356		\$1,216
1.2.8 Status Meeting 8 (Optional)		4							4	\$860	\$356		\$1,216
Task 2 - Work Plan													
2.1 Draft Work Plan	6	18	0	18	0	0	3	0	45	\$8,640	\$2,400	\$0	\$11,040
2.2 Final Work Plan	4	12		12			2		30	\$5,760	\$2,400		\$8,160
Task 3 - Bathymetric Survey													
3.1 Pre-Survey Site Inspection and Mobilization	2	16	0	31	0	32	2	0	83	\$13,220	\$38,915	\$0	\$52,135
3.2 Bathymetric Survey		4		15					19	\$3,410	\$2,225		\$5,635
3.2.1 Single Beam Bathymetric Survey		8							8	\$1,720	\$33,350		\$35,070
3.2.2 Multi-Beam Bathymetric Survey (Optional)		4							4	\$860	\$13,520		\$14,380
3.3 Reporting	2	4		16		32	2		56	\$8,090	\$3,340		\$11,430
Task 4 - Continuous Suspended Sediment and Flow Monitoring Protocol													
4.1 Site Investigation	6	58	0	224	344	308	14	0	954	\$141,920	\$11,820	\$9,108	\$162,848
4.2 Installation and Maintenance		20		80	180	172	4		456	\$85,940	\$6,210	\$3,168	\$75,318
4.3 Field Deployment		16		40	80	80	2		218	\$32,040	\$5,610	\$5,940	\$43,590
4.4 Technical Memorandum	6	12		40	24		8		90	\$15,190			\$15,190
4.5 Additional Installation and Monitoring (Optional)		2		52	60	56			170	\$24,990			\$24,990
Task 5 - Sediment Accumulation Model													
5.1 Model Development	8	24	0	0	0	0	4	0	36	\$7,440	\$77,920	\$0	\$85,360
5.2 Technical Memorandum	8	16							8	\$1,720	\$62,336	\$64,056	\$67,812
Task 6 Sediment Removal Cost & Schedule													
6.1 Development of Sediment Removal Strategies	4	8	56	0	64	0	4	0	88	\$5,720	\$15,584	\$0	\$21,304
6.2 Technical Memorandum	2	4	40		40				92	\$16,060			\$16,060
Task 7 - Close Out Report													
7.1 Draft Report	6	12	0	30	38	0	12	0	98	\$15,990	\$0	\$0	\$15,990
7.2 Final Report	4	8		20	28		4		64	\$10,660			\$10,660
Total (Task 1 through 7 Only)	36	182	56	303	446	340	41	0	1404	\$221,260	\$134,255	\$9,108	\$364,623
Task 8 - Sediment Coring (Optional)													
8.1 Sediment Coring	2	8	0	26	0	0	0	0	36	\$6,610	\$8,820	\$7,876	\$23,306
8.2 Technical Memorandum	2	4		6					10	\$1,880	\$8,820	\$7,876	\$18,576
Total (Task 1 through 8)	38	190	56	329	446	340	41	0	1440	\$227,870	\$143,075	\$16,984	\$387,929



Dominguez Channel Estuary Bathymetry and Sediment Transport Special Study

Scope of Work and Cost Estimate

Everest International Consultants, Inc.

January 28, 2017

Scope of Work

Task 1: Project Management, Coordination, and Meeting

Everest will prepare for and attend up to three team/client/stakeholders meetings throughout the project.

Task 2: Work Plan

Everest will provide suggestions on the design of the field collection program under Task 4 including the selection of field monitoring location, sampling methods and sampling frequencies; as well as review and provide comments on the work plan.

Task 5: Sediment Accumulation Model

Everest will design and conduct sediment transport modeling of the Dominguez Channel Estuary (DCE) and LA/LB Harbor to estimate an average annual sediment accumulation rate within the Dominguez Channel Estuary. Modeling will be consistent with prior work conducted for the Port of Long Beach and the Port of Los Angeles (the Ports) for the toxics TMDL.

We propose to conduct the sediment accumulation modeling in several phases. We will first conduct a preliminary model simulation using previously developed methodologies for the Ports in estimating sediment loadings to DCE from the watershed using updated data. A data analysis will be conducted to incorporate newer data from ongoing monitoring programs including the Enhanced Watershed Management Programs (EWMPs), LACFCD's mass emission station, and the Coordinated Integrated Monitoring Programs (CIMPs). The initial model results will be compared with the estimated sedimentation rate at DCE using the analyzed bathymetry data upon the completion of Task 3, and the model will be adjusted if necessary. Lastly, upon the completion of Task 4, the method developed for the Ports in estimating sediment loading from the DC watershed will be modified using the flow and sediment data collected under Task 4, and a final model validation simulation will be conducted based on the results of Tasks 3 and 4.

Once validated, the model will be used to estimate an "average" sediment accumulation rate at DCE. Since sediment loadings can vary substantially year-to-year depending on hydrological conditions, it is anticipated that model simulations will be conducted for multiple years (e.g., 10 to 20 years) such that an "average" sediment accumulation rate can be estimated.



Deliverable: A technical memorandum documenting the model setup, model parameters and model results used to estimate the average sediment accumulation rate at the Dominguez Channel Estuary.

Budget

See attached spreadsheet

LA County DC Bathymetry and Sediment Transport Study

Everst International Consultants, Inc.

Cost Estimate



Task Description	Labor						Total	
	Principal		Senior Engineer		Staff Engineer			
	\$200/Hr.		\$138/Hr.		\$94/Hr.			
	Hours	Cost	Hours	Cost	Hours	Cost		
1. Project Management, Coordination, and Meetings	16	\$3,200		\$0		\$0	16	\$3,200
2. Work Plan	12	\$2,400		\$0		\$0	12	\$2,400
5. Sediment Accumulation Model	120	\$24,000	200	\$27,600	280	\$26,320	600	\$77,920
Labor Total	148	\$29,600	200	\$27,600	280	\$26,320	628	\$83,520

Other Direct Costs			
	Unit Price	Quantity	Total Cost
Copies (8.5x11)	\$0.10 / copy	0	\$0
Copies (11x17)	\$0.25 / copy	0	\$0
Color Copies (8.5x11)	\$1.10 / copy	0	\$0
Air Ticket	\$200 / unit		\$0
Car Rental	\$50 / unit		\$0
Mileage	\$0.55 / mile	0	\$0
Other Direct Costs Total			\$0

Total **\$83,520**



Mr. Brian Murphy, PE
Principal Engineer/Project Manager
CDM Smith
555 17th Street, Suite 1100
Denver, CO USA 80202
303-383-2300

February 7, 2017

RE: Dominguez Channel Bathymetric Surveys

Pi Environmental, LLC (Pi) is pleased to provide CDM Smith with a cost and scope for performing a bathymetric survey in the Dominguez Channel. The survey area will encompass the Dominguez Channel waterway north of the Port of Los Angeles (POLA) and south of the Artesia Bus Terminal.

Pi staff have collected a variety of samples from virtually all reaches of the Dominguez Channel, and are experienced in safely working in this area. Our discussions with CDM Smith project managers and the LA County project team have suggested a dynamic approach to the bathymetric data collection for the Dominguez Channel based on safe working conditions, equipment capabilities, and logistical constraints of the site. Pi has worked with CDM Smith project managers to develop a survey plan that captures data appropriate in scale and resolution to support special study objectives.

Our phased approach is based on communicating results, developing team concurrence, and meeting the goals and objectives of the special study. Listed here are expected tasks for the bathymetric data collection effort:

Task 1. Pre-Survey Site Inspection and Mobilization

As part of the mobilization and site inspection task, the Pi team will conduct an inspection of the survey area to assess the safety of accessing the site, identify hazards (booms, rockpiles, shoals, etc.) to the survey, and make a preliminary evaluation of the feasibility of introducing high resolution equipment types (i.e., multibeam and/or Side Scan Sonars) into the survey program. In 2006, the POLA construction office could get a boat and multibeam into the channel to survey certain parts of the channel, but given over a decade has passed since those surveys, we believe it would be prudent to re-evaluate the site and make sure this is still the case.

The second part of this task will be mobilizing for the survey event. This includes coordinating equipment, project planning and meeting time, working with the project team to attain site access and/or issue notifications of survey operations, and configuring a Pi survey vessel to implement one of the two options identified in Task 2 as the primary survey method. **Total Task Cost: \$2,210**



Task 2. Survey Options

In our estimation, there are two available survey options that meet the data quality objectives of the special study, assuming the site is accessible by boat and is deep enough to support the collection equipment: a single beam only approach and a multibeam/single beam approach. These two survey options are presented below. Either survey option will require multiple consecutive dry weather days for completion:

Option A: Single Beam Only Survey

In a single beam only approach, Pi survey staff will configure an aluminum Jon boat style work boat to perform repeated acoustic transects within the DC area. The Dual Frequency (DF) 200 to 30 KHz single beam sonar will be fix-mounted to the vessel and georeferenced using a real-time corrected differential GPS (e.g., Trimble or equivalent). The single beam depth resolution is 1.0 cm. Acoustic transects will be performed along the channel edges, within the center of the channel, and equidistant along the channel to grid the channel bottom. The single beam sonar provides a DF ping that can penetrate the surface layer of material, while simultaneously resolving high accuracy depth information, helping with bottom type characterization.

Pi is anticipating 5 survey days to complete the DC survey using the single beam approach. Using a single beam method, a little more time must be spent running multiple transects to provide a greater number of points for raster interpolation. **Task Cost: \$16,730** which includes all equipment fees, vessel costs, travel, data processing, and reporting.

Option B: Multibeam and Single Beam survey

In the event the pre-survey inspection (Task 1) indicates the ability collect multibeam data in the channel, the project team will mobilize the same Jon boat style vessel, but use a Reson T50 and perform a multibeam survey to a predetermined safe location within the DC. From previous experience, we are already assuming only a portion of the DC can be surveyed using a multibeam. With this approach, there is a slightly higher equipment cost, but surveying times for the multibeam areas will be reduced. In this event, we estimated three survey days with the multibeam. The T50 has a maximum resolution of 6.0 mm. More processing time is required and the equipment is more expensive, but the areas that are surveyed with the multibeam can expect to realize better than 90 percent bottom coverage. **Task Cost: \$23,180** which includes all equipment fees, vessel costs, travel, data processing, and reporting costs.



We would like to thank CDM Smith for the opportunity to support you on this project. Should you have any questions about our costs or the scope of services, please do not hesitate to contact me at any time.

Respectfully,

A handwritten signature in black ink, appearing to read 'B. A. Mardian'.

Brent Mardian
Senior Marine Scientist
Pi Environmental, LLC
Cell 805-705-5632
bmardian@pienvironmental.com

TIME & MATERIALS COST ESTIMATE ITEMIZATION SHEET

CLIENT: CDM Smith PROJECT TITLE: DC Channel Survey PREPARED BY: B.Mardian DATE OF ESTIMATE: 2/7/2017										TASK 1				TASK 2A				TASK 2B				TASK 3			
										Mobilization/ Inspection		Single Beam DF Survey		Multibeam Survey		Multibeam Processing						Single Beam			
										HRS	COST	HRS	COST	HRS	COST	HRS	COST	HRS	COST	HRS	COST	HRS	COST	HRS	COST
PART I. LABOR										LABOR RATE															
SENIOR SCIENTIST/PROJECT MANAGER										17	\$ 1,700	45	\$ 4,500	34	\$ 3,400	20	\$ 2,000	20	\$ 2,000	20	\$ 2,000	20	\$ 2,000	20	\$ 2,000
BOAT CAPTAIN										0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
MARINE SCIENTIST										10	\$ 600	48	\$ 2,880	40	\$ 2,400	23	\$ 1,380	23	\$ 1,380	23	\$ 1,380	20	\$ 1,200	20	\$ 1,200
TECH										0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
ADMINISTRATIVE ASSISTANT										0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
TOTAL DIRECT LABOR										27	\$ 2,300	93	\$ 7,380	76	\$ 5,950	43	\$ 3,380	43	\$ 3,380	42	\$ 3,350	42	\$ 3,350	42	\$ 3,350
PART III. EXTERNAL COSTS (SUBS, RENTAL EQUIPMENT, ETC.)										RATE															
RENTAL EQUIPMENT (Seafloor Surveys)*										0	\$ -	0.6	\$ 6,000	1	\$ 10,000	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
*assumes rental period equal to quoted survey days										0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
SHIPPING										0	\$ -	0	\$ -	1	\$ 500	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
SUBTOTAL EXTERNAL COSTS											\$ -		\$ 6,000		\$ 10,500		\$ -		\$ -		\$ -		\$ -		\$ -
SUBCONTRACTOR MARKUP											0		0		0		0		0		0		0		0
TOTAL EXTERNAL COSTS											\$ -		\$ 6,000		\$ 10,500		\$ -		\$ -		\$ -		\$ -		\$ -
TOTAL COSTS SUBTOTAL											\$ 2,300		\$ 13,380		\$ 16,450		\$ 1		\$ 1		\$ 1		\$ 1		\$ 1
ESTIMATED UNITS											1		1		1		1		1		1		1		1
GRAND TOTAL NTE											\$ 2,300		\$ 13,380		\$ 16,450		\$ 3,380		\$ 3,350		\$ 3,350		\$ 3,350		\$ 3,350
PROJECT MANAGER SIGNATURE																									

ASSUMPTIONS

Task 1: Assumes one person for one monitoring day and one report. One monitoring day is 8 hrs. Mileage and O/H costs are built into hourly rate.

Task 2: A and B are possible survey options

Task 3: Included for either survey option



Mr. Brian Murphy PE
CDM Smith
Principal Engineer/Project Manager
Main 303-383-2300
555 17th Street, Suite 1100
Denver, CO USA 80202

RE Dominguez Channel Bathymetric Surveys

Pi Environmental, LLC (Pi) is pleased to provide CDM Smith with a cost and scope to collect and process sediment cores from the Dominguez channel. We understand there are still a many discussion as to the specifics of the collection, so our costs are essentially day rates for push core sediment collections. The specific points of collection will likely be determined after bathymetric data collection Pi staff have collected a variety of samples from virtually all reaches of the Dominguez Channel, and are experienced in safely working in this area. Our discussions with CDM Smith project mangers and the LA County project team, have suggested a synergistic approach to the sediment data collection for the Dominguez Channel based on previous surveys in which members of our staff were involved. Our estimate is predicated upon safe working conditions, the collection equipment capabilities, and logistical constraints of the site.

Based on our conversations with CDM Smith project managers, we have worked to develop a general survey plan that captures the essential elements of a sediment collections program that will support special study objectives. Our approach to the sediment collection tasks is based on communicating results, developing team concurrence, and meeting the goals and objectives of the special study Listed here are expected tasks for the sediment collection effort:

Task 1. Mobilization/Demobilization

As part of the mobilization/demobilization task, the Pi team will order the necessary supplies, caps, tubes, and other expendables) to facilitate the collection event. Further, our staff will also mobilize a small support vessel, and the equipment necessary spoons, tables, and decontamination supplies to enable processing of the collected core samples while onsite The Pi team will work with CDM Smith to acquire the necessary access agreements for collection, and will attend pre-planning meetings if required. Mobilization includes the costs to get people and sampling equipment to and from the project site. Task 1 Cost: \$2,380



Task 2. Sediment Collections

Using a small boat, field crews will collect push core samples at predetermined stations within the Dominguez Channel. Processing shall be onsite, with a small processing area set-up along the edge of channel to facilitate immediate processing of the samples for delivery to the analytical laboratory of CDM Smith's choosing. To remain consistent with previous programs, we will prepare to provide two staff for the collection and processing of the sediment samples. Our estimate is that 6-10 cores can be collected and processed in a day, depending on material and processing methodology. The Pi day rate is inclusive of a 10 hour work day, includes the processing area, push cores, expendables, a small skiff, and labor and travel. The Pi day rate does include analysis or containers for analysis. In our estimation, a 10 core program would take two days for collection. Day Rate \$3,220

We would like to thank CDM Smith for the opportunity to support you on this project. Should you have any questions about our costs or the scope of services, please do not hesitate to contact me at any time.

Respectfully,

Brent Mardian
Senior Marine Scientist
Pi Environmental, LLC
Cell: 805-705-5632
bmardian@pienviromental.com

TIME & MATERIALS COST ESTIMATE ITEMIZATION SHEET

CLIENT: CDM Smith PROJECT TITLE: DC Channel Survey PREPARED BY: B.Mardian DATE OF ESTIMATE: 2/7/2017				TASK 1		TASK 2	
				Mobilization / Demobilization		Push Core Collection	
PART I. LABOR				HRS	COST	HRS	COST
SENIOR SCIENTIST/PROJECT MANAGER				14	\$ 1,400	19	\$ 1,900
BOAT CAPTAIN				0	\$ -	0	\$ -
MARINE SCIENTIST				8	\$ 480	12	\$ 720
TECH				0	\$ -	0	\$ -
ADMINISTRATIVE ASSISTANT				0	\$ -	0	\$ -
TOTAL DIRECT LABOR				22	\$ 1,880	31	\$ 2,620
PART III. EXTERNAL COSTS (SUBS, RENTAL EQUIPMENT, ETC.)				AMT	COST	AMT	COST
Push Core Expendibles (tubes, caps, etc.)				1	\$ 500	0	\$ -
Processing Equipment				0	\$ -	1	\$ 100
Push Core				0	\$ -	1	\$ 500
SUBTOTAL EXTERNAL COSTS					\$ 500		\$ 600
SUBCONTRACTOR MARKUP					0		0
TOTAL EXTERNAL COSTS					\$ 500		\$ 600
TOTAL COSTS SUBTOTAL					\$ 2,380		\$ 3,220
ESTIMATED UNITS					1		2
GRAND TOTAL NTE					\$ 2,380		\$ 6,440
PROJECT MANAGER SIGNATURE							

ASSUMPTIONS

Task 1: Assumes one person for one monitoring day and one report. One monitoring day is 8 hrs. Mileage and O/H costs are built into hourly rate.

Task 2: Costs assumes two days for collection, ODCs built into rate



1550 E. Saint Gertrude Place
Santa Ana, CA 92705

Toll Free (800)327-8844
Phone (714)558-8474
Fax (714)558-3821

PROPOSAL – February 16, 2017

Tiffany Lin
CDM Smith
lnty@cdmsmith.com

SERVICE

Non Prevailing Wage Service Item	Price
Standard Traffic Control Plan per MUTCD Specifications- 2 Pages	\$600.00
Median Closure: Daily Set & Leave Monday through Friday between the hours of 7:00AM & 4:00PM. 8 hours port to port. Includes 2 technicians, 2 traffic control vehicles, and all necessary traffic control devices based upon the scope of work. Please note overtime explanation below.	\$935.00/day
Overtime Rate Overtime rates apply if job exceeds 4:00PM or 8 hours port to port.	\$70.00/hour/tech

- This is a preliminary quote based on the details provided. It is subject to revision if the scope of work changes.
- Payment Terms: Net 30
- Proposal valid 30 days

Thank you for contacting California Barricade for your traffic control needs. We are pleased to present this proposal and look forward to working with you on this project. If you have any questions or require additional information, please call.

Sincerely,


Madi Hurst